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THE NATURE OF INTEREST AND THE
CAUSES OF ITS FLUCTUATIONS

SUMMARY

I. Capital defined as wealth produced by labor and destined to satisfy wants in the future, 547. — The possibility of interest due to the fact that capital saves labor, 550. — Concrete illustration of the saving, 551. — II. Illustration of the circumstances which may affect the rate of interest under hypothetical conditions, the main conclusions of the present essay being suggested. — Capital quantitatively expressed in terms of labor multiplied by the time intervening between labor and enjoyment, 553. — III. Circumstances affecting the demand for capital: (a) The opening of new lands, 557. — (b) Inventions, 560. — Under certain conditions the ultimate effect of these circumstances is opposite to their immediate effect, 561. — (c) Variations in the aggregate consumption of society, 563. — Effect of such variations on the supply of capital, 564. — Supply of capital also affected by the quantity of labor expended, 567; which for a given population depends on the amount of leisure enjoyed and on the efficiency of labor, 568. — Conclusion on ultimate causes permanently affecting the rate of interest. — Why capital has always been able to earn interest, 569.

I

Is waiting a separate factor of production? It is so regarded by Professor Cassel,¹ and the same view seems to be implied in many other theories of interest. To the present writer, however, it seems doubtful whether it should be regarded as a conscious process at all. No

¹ *The Nature and Necessity of Interest*, chap. II, § 4.

doubt with some people it is; but others decide on their expenditure first, and then save the balance of their income. To regard waiting in all cases as a deliberate act seems to assume that everybody decides first how much he must save, and then spends what is left. At any rate, it seems possible to account for interest and its fluctuations without assuming a peculiar kind of human exertion on the action of which all saving is dependent.¹

Economic literature is amazingly rich in definitions of capital, and the first task of a writer on interest must be to decide which he will adopt. I have chosen that which is expressed by Professor J. Shield Nicholson as follows: "Capital is wealth set aside for the satisfaction — directly or indirectly — of future needs,"² — exclusive, it is necessary to add, of the gifts of nature. This definition does not class goods destined for immediate consumption as capital, altho it does those which are in the hands of their ultimate consumers if of a durable character or in any sense destined to satisfy future wants.

Apart from the question as to whether capital includes land, it might be thought that this conception of capital is practically the same as that of Professor Fisher, for whom capital is practically synonymous with wealth.³ All goods satisfy future wants. When a man sits down to dinner, the wants which he is about to satisfy are still future. The only difference is one of degree.

All this is true. Yet a difference in degree may be so great as to amount to a difference in kind. For illustration take the concepts of utility and value. Everything which has utility does not possess value; but everything which has value must possess utility. Some

¹ See F. H. Knight, "Neglected Factors in the Theory of Normal Interest," vol. *xxi* of this Journal, pp. 284-90, where the importance of "time-preference" is questioned

² Principles of Political Economy, Bk. I, chap. vi, § 4.

³ The Nature of Capital and Income, chap. IV, § 2.

things, such as water, are on the border line, possessing value in one place and not in another. There is in fact no hard and fast distinction between utilities which do and which do not possess value. Yet no one says that value is synonymous with utility.

The distinction which I propose to make between capital and wealth is analogous. All capital is wealth, but all wealth is not capital. The element of time is essential to the latter. If wealth consists of things which are scarce and which satisfy wants, capital will consist of things which are scarce and which will satisfy wants after an interval of time. Wealth is measured in terms of value; capital might be measured in terms of value multiplied by time. The significance of this conception will appear more fully in what follows. An important modification is required to make it generally applicable; but it may be here remarked that, if a business man is trying to decide whether a certain undertaking will be profitable or not, he must find out not only how much outlay will be necessary but also the time which must intervene between the outlay and the attainment of the final result — how long his capital will be locked up, in other words.

The line, then, which may be drawn between capital and wealth is this: if either because the value is so small or the time so short that the interest which is or might be paid is negligible, the thing in question is wealth, but not capital; if the interest is worth taking into account, the thing is capital. In fact, capital might be defined as wealth which yields or could be made to yield interest.

It is hardly necessary to point out that any concrete commodity could be made in effect to yield interest if borrowers are willing to pay for its use during a certain time more than must be set aside to cover depreciation. In strict logic, of course, everything which will satisfy a

want or yield a service in the future should be counted as capital, no matter how small the value or how short the time. The present value of any future service is theoretically different from the value of that service at the moment when it is being rendered, by a sum equal to what the discount on its value would be, if it were discounted at the current rate of interest. In theory, therefore, if this sum exists at all, the right to exact the service in question must be classed as capital. In practice, however, the distinction between capital and wealth is obvious enough, for if this sum were negligible the right in question would fall into the latter category only. For theoretical purposes, it must be admitted that the definition of capital here adopted is scarcely distinguishable from Professor Fisher's, except in excluding the gifts of nature. I believe that the present conception of capital will not be found to differ from that presented by Professor Taussig, who distinguishes between capital and land,¹ and points out that, for some purposes of economic analysis, producers' and consumers' capital are similar,² and that the difference between them "is one as to time when satisfaction or utility accrues."³

The subject of the present essay is the normal, not the market rate of interest. "Appreciation and Interest," and all fluctuations due to changes in the value of money, are left out of account. The element of risk, also, will be assumed to be absent.

While a certain amount of labor might be done for pleasure labor is, as a rule, disagreeable and is only expended with some ulterior object in view. Now the

¹ Principles of Economics, chap. XXXVIII, § 1; chap. XLVI.

² Chap. V, § 2; chap. XL, §§ 3, 4.

³ Chap. V, § 2, note; cf. chap. XV, § 4.

only possible object of labor, from the point of view of economics at any rate, is the satisfaction of wants.

In general, however, everyone desires to reap the reward of his labor as soon as possible. The existence of interest would be alone sufficient to account for this; for if goods can be exchanged, and if present goods are worth more than future goods, the former would always be preferred, for every man prefers a greater to a less. If, however, a person could be supposed ignorant of the existence or possibility of interest, it would be necessary to account for his undoubted preference for present over future goods on psychological grounds, as Böhm-Bawerk and his followers do. But this simple preference is all that we need postulate. We shall find it unnecessary to attempt to measure it, or to assume that it has ever been greater than it is at present, altho, as John Rae has so well shown,¹ we should be amply justified in doing so if it were necessary.

In spite of the impatience which thus is natural to human beings, some labor is always being expended in providing for wants in the future — sometimes in the very distant future. If both labor and waiting for the result of labor are disagreeable, this can only be explained by the fact that in the long run labor is saved. It is found that wants can be satisfied with less labor in the aggregate if part of the labor is applied to preparatory operations, and the whole is spread over a considerable time, than would be necessary if all the labor were applied directly to the satisfaction of immediate wants.

“ There being need of a given amount of food, it can be obtained with less expenditure of labour, if the labour is mostly performed several months before the supply becomes necessary, than if nothing is done until the day is at hand on which there is a demand for food. If the

¹ *New Principles of Political Economy*, Bk. II, chap. vii.

labour is delayed until the time arrives, the only remaining resources for acquiring nourishment are hunting, fishing, berrying and the like; and of these the supply is very limited and much work is required to obtain a supply from these resources if any considerable quantity is required. On the other hand, if land is ploughed, prepared and sowed to wheat several months before there is a scarcity of food, a much larger amount of food is produced, and at a much less expenditure of labour. Again, a supply of cloth being essential, a much larger quantity can be obtained for the same labour if, previous to the time when it is required, a part of the labour has been employed to prepare machines on which the cloth can be woven.”¹

Now, capital consists of things which are produced by labor, and which satisfy wants after an interval of time; and all labor has for its object the satisfaction of wants; therefore, labor which will not satisfy wants until a future time is, in reality, devoted to the production of capital. What the accumulator of capital does for society is to enable — or compel — people to labor for the sake of future benefits, whereas without him they would be inclined to devote all their labor to the satisfaction of immediate wants. The final result of his intervention is that society has its wants more amply satisfied with far less labor than would be necessary if production were carried on without capital. The possibility of interest is thus accounted for.

¹ S. N. Patten, *The Fundamental Ideal of Capital*, vol. iii of this Journal, p. 189.

II

The actual benefit derived from the employment of capital in any particular instance could be ascertained in the following way. If we could measure the labor expended in any preparatory operation; for example, in making a particular machine, and also measure the labor saved by this machine — that is, the difference between the labor required to produce a given commodity with the machine and the labor which would have been required without it — we shall know what return is yielded by the labor expended in the preparatory operation in this instance.

It is often impossible to determine where the preparatory labor ends and where the labor immediately necessary for consumption commences. Often the very same operation is necessary for consumption in the present and preparation for the future. Further, nearly all operations require tools, the fruit of previous labor, which must accordingly be credited with a part of the gross result. As far as possible both these difficulties are avoided in the following illustration.

Suppose some villagers dwell near a practically inexhaustible oyster bed, from which they can supply themselves by direct labor, without tools. If one man builds a fishery of brushwood (for which he would require no tools worth taking into account,¹ he will probably be able to repair the fishery completely, and catch as many fish as are in his estimation equivalent to the oysters he gathered before, with less labor than would be necessary to obtain the latter. The labor thus saved, expressed as a percentage of that required to build the fishery, will give the rate of interest yielded by the labor

¹ Such fisheries are common on both shores of the River St. Lawrence, below Quebec.

thus invested. The fishery being everlasting, the return will be perpetual. It may be assumed for the present that the man will eat either fish or oysters indifferently, but that his desire for either is limited and remains unchanged. If all capital be similar to such a fishery, the fact that it earns interest should excite no surprise.

The causes affecting the rate of interest may be illustrated under the same hypothetical conditions, and the fact that it never sinks to zero accounted for.

If the beach available for such fisheries were limited, their number could not increase indefinitely without making fish harder to catch. If some sites were superior to others, the men who occupied the former would obtain an extra return which must be classed as rent. If all sites were equally advantageous, it is evident that after a certain point the number of fish caught by means of the fishery in a day's labor, or the number of days' labor required to catch a given quantity of fish, will vary inversely with the number of fisheries in use. Since all the fisheries are supposed interchangeable, the last one built would represent the marginal increment of capital, and its returns would, in the absence of other circumstances, fix the rate of interest in the village.

If every fishery were worked by its owner, no one might be aware that they were yielding interest. But if fisheries were loaned, interest would be paid. For, if fisheries are freely reproducible in a short time, their capital value would be fixed by that of the labor required to build them; but their annual value would be equal to that of the labor they saved. The number of days required to gather the desired supply of oysters would be the standard, for the men without fisheries would continue to labor in this way.

Suppose, now, new fishing grounds become available, where fisheries are no harder to build, but where the

desired supply of fish could be caught in fewer days than had been necessary on the original beach. The returns obtained from labor employed in building fisheries under the new conditions would fix the general rate, and the capital value of the old fisheries would fall till they yielded the same proportional return as the new. This would amount to a rise in the rate of interest.

But even if the beach available for fisheries were unlimited, their returns would tend to fall. Without a fishery we may suppose every man to have worked for one hundred days a year at gathering oysters. The first fishery may save its owner fifty days. Now, a second fishery may enable him to catch more fish in a day than he could with only one, but it cannot save him fifty days also, for that would mean his catching his supply of fish, and keeping both fisheries in repair, without any labor whatever. Yet a saving of fifty days would be necessary if the second fishery were to yield the same return on the labor expended in building it. In other words, after a certain point, additional fisheries will yield diminishing returns, whether or not space is limited.

Again, suppose an invention by which a fishery yielding a greater return can be built with the same amount of labor, or a fishery yielding the same return can be built with less labor; in this case also the capital value of the old fisheries would fall, and the general rate of interest rise. Eventually, however, it would tend, as before, to fall owing to the multiplication of fisheries. No single invention could be a permanent cause of high interest.

The rate of interest is thus shown to be reduced by an increase in the number of fisheries, and raised temporarily, but not necessarily in the long run, by the opening up of new fishing grounds, and by inventions.

The greater the number of fisheries, and the greater the return obtained from each, the more labor will be set free; and, if this labor be spent in building additional fisheries, the faster these will multiply. We could imagine such a number being made that the rate of interest would fall to zero. Probably this stage would never be reached, for the villagers would prefer one hundred days present leisure to, say, four days leisure annually for all future years, and this would keep the rate of interest at, let us suppose, 5 per cent. Just what the rate would become would depend on the intensity of the villagers' desire for present leisure, and the rate at which they discount the future.¹

The intensity of the villagers' desire for fish would also affect the rate of interest. In this connection an answer will be given to the criticism which Böhm-Bawerk brings against productivity theories — that they fail to explain surplus value.²

Hitherto it has been assumed that fish and oysters would satisfy the same wants, and that the total consumption of both together was constant. We shall now discontinue this hypothesis, and assume instead that the total expenditure of labor is constant. In that case, the advantage of a fishery would be that it would enable a man, expending a given amount of labor, to catch a number of pounds of fish larger than the number of pounds of oysters obtainable by a man without a fishery, with the same expenditure of labor. The return yielded by a fishery, then, would depend on the value of this surplus in the quantity of fish, which would be determined by the rate at which the value of fish, measured in oysters, would fall owing to the increase in the supply;

¹ This part of the argument is the outcome of a suggestion of Professor Taussig's. It seems to be in agreement with Professor Fisher's theory regarding preference for present over future goods.

² Capital and Interest, Bk. II.

in other words, on the elasticity of the demand for fish, or on the intensity of the villagers' desire for that article of diet. If the physical productivity of the fisheries was given, the general rate of interest would vary directly with the intensity of the community's desire for their product.

This cause, which below will be referred to generally as the intensity of wants, is thus shown to affect the rate of interest if the supply of fish is given, but it would also affect the number of fish caught and, through that, the number of fisheries which would be built. For, the more fish our villagers desire to consume, the more labor will be devoted to catching them, and hence, if the amount of leisure enjoyed remains constant, the less labor can be devoted to the construction of additional fisheries. It follows that the more intense the villagers' desire for fish, the less will be the tendency for the rate of interest to fall owing to an increase in the supply of fisheries.

It may therefore be stated that the rate of interest will tend to vary with the intensity of the villagers' desire both for leisure and for fish.

The main contentions of the present essay have now been indicated. In what follows the foregoing reasoning will be applied generally.

III

It was provisionally stated above that capital should be measured in terms of value multiplied by time. But the difficulty with this is that the value of capital depends on the rate of interest. That is to say, if the income from a certain set of capital goods is given, their value will vary inversely with the rate of interest.

There are cases, however, in which the above method of measuring capital would be correct. Of freely repro-

ducible goods the value conforms in the long run to their cost of production. The rate of interest generally affects the cost of production, because more capital is required in the making of some goods than of others; that is to say, the labor is differently distributed in point of time. In some cases, however, this does not happen. Certain goods may exchange in direct proportion to the labor required to produce them, and their relative values may not be affected by changes in the rate of interest. In these circumstances, capital could with perfect accuracy be measured in terms of its value multiplied by the time intervening between the moment when the outlay was incurred, and the moment when the capital has rendered all the services of which it is capable.¹

But the quantity of capital must be expressed by a method which will apply not only to some cases but to all. Such a method will suggest itself if the foregoing reasoning is carried a step farther.

All capital is the result of labor. All labor may be said to have for its object the satisfaction of wants, but capital satisfies wants only after an interval of time. A given quantity of capital, then, means a given quantity of labor which will not finally result in satisfactions until after a given interval of time. The essentials of capital are labor and time, and an increase in either of these, the other being constant, or in both together, would constitute an increase in the quantity of capital. It is important to notice that some interval of time must elapse between the completion of the labor and the enjoyment of its result; otherwise the product of the labor would not be capital (as that word is defined above) but only wealth.

The circumstances affecting the demand for capital will first be considered. But in this connection the

¹ See John Rae, *New Principles of Political Economy*, Bk. II, especially chaps. i and ii.

idea conveyed by the word demand requires careful analysis.

Demand is defined by a recent writer ¹ as "effective desire, that is, desire coupled with the ability to pay the current price for the desired object." Dr. Marshall writes, "When we say that a person's demand for anything increases, we mean that he will buy more of it than he would before at the same price, and that he will buy as much of it as before at a higher price." ² Now, if he would pay the higher price for a smaller quantity than before, would not his demand be increased in that case also? His demand might be said to consist in the price he offers, and not in the quantity he desires, for any person's desire for a thing that has value is infinite. In other words, the demand for any commodity could be conceived to have nothing to do with the quantity of that commodity, but might refer solely to the quantity of other commodities, or rather the value, which is offered in exchange for it. The same thing applies to capital. The demand for capital might be said to consist simply of the amount of interest it can earn.

"At any given period the rate of return on capital depends on the gain in productiveness from the least effective part of the capital. So far as this proposition is concerned there seems to be substantial agreement among modern economists." ³ If this be granted, any circumstance which will increase the advantage attributable to the last instalment of capital, without necessitating a proportional diminution in its amount, will increase the demand for capital.

The first circumstance which might be expected to act in this way is the development of new lands. If a

¹ H. R. Seager, *Principles of Economics*, § 42.

² *Principles of Economics*, Bk. III, chap. iii, § 4.

³ Taussig, *Principles of Economics*, chap. XXXVIII, § 5.

new country containing abundance of fertile land, like the Canadian Northwest, is opened up for settlement, a given crop can be raised with less labor in it than would be required in a densely populated country like England. But before these new lands can be cultivated much labor must be spent in the construction of buildings, railways, etc., a great part of which will earn nothing for years, and which will not render all the services of which it is capable perhaps for centuries. Nevertheless, after sufficient time has elapsed, the satisfactions which this labor will yield, or the return to this investment, are much greater than could be obtained from the same outlay in England.

If an interval of time must elapse between the expenditure of labor and the enjoyment of its result, the product of that labor is capital. If the whole productive process obtains a greater reward, capital must reap at least part of the benefit. Wages will also rise, but inasmuch as so large a share of the whole product must be imputed to capital, laborers could not hope to engross the whole advantage of the increased return. The rate of interest would therefore tend to rise. This explains why interest is always high in new countries.

Inventions are the second of the circumstances which affect the demand for capital. The effect of every successful invention must be to enable the same labor to produce greater returns, or less labor to produce the same returns. In any case the labor will become more effective, and the returns greater in proportion to the outlay.

The chief benefit may accrue either to the laborers or to the owners of the capital employed in that branch of production. If the effect of an invention is to increase the time which must elapse between the expenditure of the labor and the enjoyment of its final result, it might

be expected that the owners of capital would reap the whole benefit of the increased return, for they would be placed in a more advantageous position in competing with those who endeavor to render the same service directly, with the aid of little or no capital. Electric tram-cars, for instance, compete more effectively with cabs than horse cars could possibly have done.

If the effect of the invention is to reduce the interval of time during which labor must wait for its final result, interest might be expected to show less tendency to rise than wages. For, in the absence of a patent, and if the process were not kept secret, new opportunities would be opened to those who could afford to wait but a short time — to employ but little capital — and the latter would be placed in a better position to compete with those who rendered the same service by means of a more roundabout process. Inventions, such as knitting machines, which enable domestic manufactures to compete with goods made in factories, would illustrate this phenomenon. The tendency in this case also might be to raise interest, but the effect on wages would be greater.

Under actual conditions, the question of prices must also be considered. In the absence of a patent, these might be reduced so much that the consumer would be the only one to benefit. It seems, therefore, futile to attempt to forecast the effect of any particular invention on interest and profits in general.

These observations refer to the proximate effect of inventions on interest. Their ultimate effect requires separate consideration.

For the present we shall make the assumption that the aggregate consumption of society remains constant. For brevity the single word "consumption" is used as equivalent to what Professor Fisher calls "enjoyable

objective services,"¹ and includes not only material goods but also labor of every kind which satisfies wants directly and immediately. It is synonymous with the whole real income of society, and is the final object of all its labor.

If, then, the aggregate consumption of society were constant, it is evident that in the long run the effect of every successful invention would be to lessen the labor required to provide for this consumption. As has been pointed out by Professor Taussig, the effect of this might be that people would have more leisure; but we may assume that the leisure they enjoy also remains constant, and that everyone continues to work as hard as before. Under these suppositions, what could they work at? Not the satisfaction of immediate wants, for that is contrary to the hypothesis of constant consumption. They must, therefore, spend the labor saved by the invention in satisfying future wants, that is, in producing capital. But an indefinite increase in the supply of capital must lessen the return to the last instalment of capital, and cause a decline in the rate of interest. The conclusion is that if consumption were constant and people allowed themselves no more leisure, the ultimate effect of any single invention would be to reduce the rate of interest. Only a succession of inventions would keep the rate of interest high indefinitely.

Exactly the same reasoning applies to the opening up of new countries. Their effect on the rate of interest, both immediately and ultimately, will be the same as that of inventions.

These two are in essence different phases of the same general phenomenon. Invention consists in the discovery of new properties, or new ways of utilizing the properties of existing materials. The opening up of new

¹ The Nature of Capital and Income, chap. X, § 1.

lands consists in making an addition to the stock of materials presently available. The above discussion, therefore, has shown the effect of an increase in the supply of natural objects, which, being a factor in the production of wealth, constitute a third essential element of capital. And, it need hardly be said, inventions and the opening up of new lands cannot be looked upon as an exhaustive list of influences of this sort. Anything which increases the efficiency of labor suddenly may have a similar effect.

None of these phenomena, however, can be regarded as offering a final solution of the problem of interest. While their immediate effect may be important, it is neutralized after a certain time has elapsed. How great will be that immediate effect, and how much time will elapse before it is neutralized, will depend on other circumstances, to the investigation of which we now proceed. These other circumstances are the permanent and ultimate forces acting on the rate of interest and accounting for its continued existence. They act independently of new discoveries, which may therefore from now on be disregarded.

The third circumstance which may affect the demand for capital is variations in the intensity of wants. It is a commonplace that people's desires for some things are more intense than their desires for others; and that any person's desire for a particular thing is more intense at one time than at another. Is it not possible that there might be an increase in the intensity of every person's desire for things in general? Such would be the consequence, for instance, of a spread of the spirit of recklessness and extravagance. Wants in this connection are intended to refer to the present;¹ and it may be laid

¹ The intensity of wants thus corresponds to Professor Fisher's "time-preference" (*The Rate of Interest*, chap. 6). Neither the one nor the other could influence the rate of interest except by affecting present consumption.

down as a general proposition that, the more intense are people's wants, the more they will consume. Variations in the intensity of wants thus become synonymous with variations in consumption; for the intensity of wants can be measured, and can be conceived to affect the rate of interest, only by their effect on actual consumption.

Let us consider the effect of a general and fairly sudden increase in the intensity of wants. It means that more direct service and immediately consumable commodities are demanded. But the stock of these on hand at any given time is not indefinitely extensible.¹ If it were perfectly rigid, it would seem certain that the prices of the existing supply would rise. This supply might, however, be increased without a rise in prices; but that can be done, in general, only by making inroads on the stock which was originally destined for future consumption. Supposing wants to continue to increase, or even to remain constant at the higher level, a scarcity must shortly be felt, relatively to the demand, and prices would rise. Exactly where the rise would first be felt would depend, it seems to me, on the relative bargaining capacity of producers, traders, and consumers. Very likely "materials" and goods nearly but not quite ready for the consumer would be the first to rise in price, and the prices of "foods" and goods immediately consumable would follow the former. It seems, however, impossible to escape the conclusion that an increase in the intensity of wants would cause a rise in the prices of immediately consumable goods and services.

A general rise in all prices is not a necessary consequence. The rise in the prices of the above kinds of goods and services would only be relative to those of such goods as could not be consumed till after a considerable time had elapsed. If the general price level is

¹ See Taussig, *Wages and Capital*, pp. 57, 88-90.

fixed within narrow limits by the quantity of money in circulation, the prices of the latter goods might fall to counterbalance the rise in the prices of the former. If so, that would amount to a rise in the rate of interest, for the premium in value of present over future goods would be increased.

There is another ground on which an increase in the intensity of wants might be expected to cause a rise in the rate of interest. If a larger quantity of immediately consumable goods is demanded, more will presumably be sold. Then, provided only that their prices do not fall, the profits obtained by the owners of existing capital must rise also. It is true that money wages would increase, but chiefly those of laborers who satisfied wants directly. Laborers who coöperate in production with a great deal of capital could not hope to reap the whole benefit of the larger gross receipts, for the specific productivity of the last instalment of capital — the output of each machine employed in manufacture — would be augmented.

If the rate of interest rises owing to an increase in the intensity of wants, a decrease in their intensity would tend to cause the rate to fall. No further attempt will be made to prove this proposition. It appears to be the exact converse of the first, and all the phenomena might be expected to act in exactly the opposite direction.¹ We may therefore state as our first general conclusion that the rate of interest tends to vary with the intensity of wants or, what amounts to the same thing, with the total quantity of commodities consumed and of services enjoyed.

It may be objected to the above reasoning that it proceeds upon the assumption that the total quantity of

¹ See Taussig, *Principles of Economics*, chap. 41, on "Overproduction and Overinvestment."

capital will not increase. Now, it may be asked, if a greater quantity of goods than before can be sold at the same or higher prices, and if the employment of capital becomes more profitable in consequence, will not the supply of capital be increased, so that the advantage of the marginal instalment will be diminished, and the rate of interest fall? It might even be contended that the supply of consumable goods would be increased so much that their prices would fall to their former level, which would be a further force tending to depress the rate of interest. The reply to this is, that an increase in the intensity of wants must involve an increase in the quantity of goods and services consumed, and by itself could not possibly lead to an increase in the supply of capital, but must on the contrary tend to diminish it. Only one circumstance could counterbalance this tendency; and in this circumstance will be found the remaining important factor influencing the rate of interest.

As capital is conceived in the present essay, it is partly in the hands of consumers, partly in those of producers. As regards consumers, it is obvious that, while their incomes remain the same, the more they spend in satisfying immediate wants, the less they can save to provide for the future. Therefore, so far as consumers are concerned, the supply of capital will tend to vary inversely with their immediate consumption.

The same conclusion can be reached as regards producers. If the supply of capital is given, the only way in which present consumption can be increased is by increasing the amount of labor devoted to satisfying wants immediately. But the total amount of labor of which any community is capable—the gross annual product—is not unlimited. If we assume it to be constant, the more labor is devoted to satisfying wants immediately, the less can be devoted to the production

of capital, with the object of satisfying wants in the future, and the smaller will be the future supply of capital.

As regards both consumers and producers therefore (if we assume the total quantity of labor expended to remain constant) in the long run the supply of capital will vary inversely with consumption.

Just as an increase in the supply of capital will tend to cause a fall in the rate of interest, so an indefinite shrinkage would cause it to rise, whence it follows that the rate of interest tends to vary inversely with the supply of capital. Accordingly, the proposition that the rate of interest tends to vary directly with the aggregate consumption of society is not invalidated, but is given a further ground to rest on.¹

It remains to investigate the important influence tending to prevent a rise in the rate of interest, and of prices, owing to increased consumption. The proposition that the rate of interest tends to vary with the intensity of wants is only valid upon the assumption that the total quantity of labor expended by the whole of the community is constant. This cannot normally be the case, for an active demand stimulates trade activity, and induces those who supply the market to expend more labor in the task. It is now necessary to define a little more precisely what is meant by an increase in the quantity of labor expended, and what will be the effect of such an increase on the rate of interest.²

The total quantity of labor of which any given community is capable depends upon the number of persons

¹ Reverting to the possible effects of new discoveries, it is evident that most of them will increase the intensity of wants, or rather, what amounts to the same thing, will create new desires. The invention of motor cars, and the importation into Europe of diamonds from South Africa and of tobacco from America, have caused a general increase in the consumption of such articles, and in the resources devoted to their production. In so far, therefore, new discoveries have a permanent and ultimate as well as an immediate tendency to raise the rate of interest. Probably this has been their general effect.

² In the following reasoning I am aided by a suggestion from Professor Taussig.

composing it who are able to work, and on the physical, mental, and moral qualities of each. Any investigation into the causes which may determine these circumstances clearly lies beyond the scope of the present inquiry. It is necessary to assume that the general character of the population remains the same.

The total quantity of labor which any population will actually expend during a given period, a year for example, depends in the first place on the total amount of time devoted to labor. That is, it depends on the number of hours in a day and of days in the year during which each of its members works. For each man, therefore, it varies inversely with the amount of leisure he allows himself. The term "labor" is of course intended to include not only manual labor but all forms of clerical and intellectual labor as well. We may therefore conclude that, other things being equal, the total quantity of labor expended varies inversely with the total amount of leisure enjoyed.

If the time actually spent in labor is given, the quantity of labor will depend on the intensity, dexterity, and intelligence with which that labor is applied; in other words, on the efficiency of labor. The measurement must in this connection be objective, as only thus can it have any application to the present reasoning. It may therefore be stated that the total quantity of labor expended by any population in a given time varies directly with the efficiency of their labor, and inversely with the amount of leisure they allow themselves.

It is now necessary to consider briefly the effects of an increase in the total quantity of labor expended. Supposing total consumption to remain constant, the quantity of labor which must be expended in the immediate and direct satisfaction of present wants also remains constant. Therefore, if the total quantity of labor

expended by the community is increased, more labor must be devoted to satisfying future wants, in other words, to the production of capital. Accordingly, if consumption remains the same, the supply of capital will vary with the quantity of labor expended. But it will not, I think, be disputed that under the same assumption the rate of interest would vary inversely with the supply of capital. Recalling what was established above as to the effect of variations in consumption, it becomes possible to formulate the conclusions of this essay in the single proposition — the rate of interest tends to vary directly with the aggregate consumption of society, and with the amount of leisure which people allow themselves,¹ and inversely with the general efficiency of labor.²

To summarize my conclusions: in the view here presented all capital consists essentially of labor-saving devices. Capital yields interest because a given product can be turned out with less labor with the aid of capital than would be necessary without this aid. That is equivalent to saying that the same labor can turn out a larger product with capital than without, which is the result arrived at by those who support the productivity theory.

Professor Carver gives an able presentation of this view.³ But he goes on to point out that if the supply of capital increased indefinitely, interest would sink to zero. What, then, prevents capital from increasing up to this point? He answers that question as follows:

¹ As this proposition was originally conceived, the element of leisure was omitted. Its inclusion is due to Professor Taussig's suggestion.

² As to new discoveries, the above observations must now be further qualified. In addition to saving labor they may increase its efficiency. This would be the usual effect of anything which creates new or more intense desires, for it offers new motives for exertion; and increased consumption may also increase the general capacity for labor. For this reason, some new discoveries may have a stronger tendency to reduce the rate of interest than to raise it.

³ *The Distribution of Wealth*, chap. 6.

“ Such a check is found in the conjunction of two facts: first, the owner of capital must wait for its earnings to come in; second, as a rule, men do not like to wait.”¹ In his application of this he seems to regard waiting as, in some sort, a conscious process.

While it is quite true that, in general, people are anxious to reap the reward of their labor as soon as possible, it does not seem necessary to regard labor as a separate factor of production. The answer to this question suggested by the present essay would be that capital is always able to earn interest simply because people work so little and consume so much.

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¹ The Distribution of Wealth, p. 228.